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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
VLAHOS, SOPHIA	
ART UNIT	**PAPER NUMBER**
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,152	ZHENGDI, QIN	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 9-16* is/are rejected.

7)☒ Claim(s) *6-8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/02/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 3 objected to because of the following informalities:

Claim 3 includes numerals in parenthesis: "(31,41,51,61)" that should be removed.

Claim 4 includes numerals in parenthesis: "(31,41,51,61)" that should also be removed.

Claim 5 includes numerals in parenthesis: "(31,41,51,61)" that should also be removed.

Claim 9 includes numerals in parentheses: "...pulse shape (61) and a real pulse shape (65)." That should be removed.

Claim 10 includes numerals in parentheses: "...pulse shape (61) and a real pulse shape (65)." should also be removed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 9-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tiemann et. al., (U.S. 6,118,808).

With respect to claim 1, Tienmann et. al., disclose: taking samples of said received signal (see column 12, lines 3-7, where every sample of the received signal corresponds to each 1.0ms segment stored in the signal memory and processed by elements 23,29,30 (in the system of Fig. 4)); determining at least three samples, of

which at least one has a signal strength exceeding a threshold value (see column 12, lines 13-16, function of block 31 of Fig. 4, where the determination of the at least three samples of which at least one has signal strength exceeding a threshold is preformed sequentially by the threshold detector, and see Fig. 14 where the dots are the accumulated correlation samples, see column 18, lines 33-44); and determining the position of said pulse peak based on an interpolation of at least two of said determined samples (see column 18, lines 45-66, the determination of the autocorrelation peak corresponds to the determining of the pulse peak (see lines 45-49)), which at least two samples are selected based on the signal strengths of said at least three determined samples, and which interpolation includes an evaluation of the signal strength of said at least two samples (see column 18, lines 50-53, see searching for the two largest adjacent entries, and A,B and C,D define line equations (i.e. the values of A,B, C,D are used to compute the line equations) that intersect at the pulse peak).

With respect to claim 2, all of the limitations of claim 2 are analyzed above in claim 1,and Tiemann et. al., disclose: wherein different equations for said interpolation are provided for different distributions of the signal strengths of said at least three determined samples (see Fig. 4 (which is an illustrative example), where it is understood that the position of points A, B, C, D have different distributions (the position of the dots varies) every time the receiver operates, and therefore, different line equations are computed to determine their intersection that corresponds to the pulse peak).

With respect to claim 3, and Tiemann et. al., disclose: wherein said at least two samples are selected based in addition on a model for a pulse shape (see fig. 4, the triangle function, see column 18, lines 41-44).

With respect to claim 4, all of the limitations of claim 4, are analyzed above in claim 1, and Tiemann et. al., disclose: wherein equations for said interpolation are determined based on a model for a pulse shape (see fig. 4, the triangle function , see column 18, lines 41-44).

With respect to claim 5, all of the limitations of claim 5, are analyzed above in claim 1, and Tiemann et. al., disclose: wherein said model of said pulse shape has a triangular shape (see triangle shape shown in Fig. 4).

With respect to claim 9, all of the limitations of claim 9, are analyzed above in claim 9, and Tiemann et. al., disclose: wherein a weighting of the signal strengths of samples used in said interpolation is performed before said interpolation based on known deviations between said model of said pulse shape and a real pulse shape (see Fig. 14, where the solid line (triangle function) corresponds to the model of the pulse shape and the real pulse shape corresponds to the pulse shape(s) obtained using the "x" the typical samples (see the "x" distributions at each one of points A,B, C, D and so on, where the values of x are known and so is the model of the pulse (solid line)

therefore the deviations between the model and the real pulse shape is known) are normalized (weighted) to obtain the dots, and see that for example the dots at points C, D, where at point C the weighting moves the dot upwards towards the two topmost xx, whereas at point D the weighting moves the dot downwards towards the xxxx points).

With respect to claim 10, all of the limitations of claim 10, are analyzed above in claim 4,and Tiemann et. al., disclose: wherein a correction of a position determined based on said interpolation is performed based on known deviations between said model of said pulse shape and a real pulse shape and based on the signal strengths of said samples

With respect to claim 11, all of the limitations of claim 11, are analyzed above in claim 1, and Tiemann et. al., disclose: , wherein said at least three samples are consecutive samples (see column 12, lines 13-20, where the threshold detector consecutively checks the thresholds and supplies samples to the control 35, that performs the search and interpolation).

With respect to claim 12, all of the limitations of claim 12, are analyzed above in claim 1, and Tiemann et. al., disclose: means for determining the position of a peak of a pulse in a signal received at a receiver according to claim 1 (see Fig. 4, specific components 33, 23, 29, 30, 31, and 35, also mentioned above in the rejection of claim 1).

With respect to claim 13, all of the limitations of claim 13 are analyzed above in claim 12, and Tiemann et. al., disclose: wherein said device is said receiver (see column 3, lines 4-7, discussing the conventional acquisition apparatus used in a GPS, receiver, and Fig. 4 is an embodiment of the present invention, which is (part of) a GPS receiver, see also abstract).

With respect to claim 14, all of the limitations of claim 14, are analyzed above in claim 12, and Tiemann discloses: wherein said device is a device external to said receiver and comprises further means for receiving from said receiver information on said received signal (see Fig. 4, GPS receiver structure, separate block RF/IF supplying signals to components 33,23,29, 30, 31, and 35 that perform the search and interpolation).

With respect to claim 15, all of the limitations of claim 15, are analyzed above in claim 14, and Tiemann et. al., discloses: wherein said device is a network element of a cellular communication system (see column 3, lines 4-7, discussing the conventional acquisition apparatus used in a GPS receiver (network element), and Fig. 4 is an embodiment of the present invention, which is (part of) a GPS receiver (considered to be a network element), see also abstract)

With respect to claim 16, all of the limitations of claim 16, are analyzed above in claim 1,and Tiemann et. al., disclose: Cellular communication system comprising a device according to claim 1 (see abstract invention relates to a receiver in a GPS system, see also column 9, lines 6-7, discussing the conventional acquisition apparatus used in a GPS receiver and Fig. 4 is an embodiment of the present invention, which is (part of) a GPS receiver).

Allowable Subject Matter

4. Claims 6-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abraham et. al., (U.S. 7,006,556) discloses a method and apparatus for determining the position of a correlation peak by fitting the data using least squares method (interpolation).

Kang et. al., (U.S.2003/0043889) disclose: a method and apparatus for determining energy peaks by interpolating neighboring (left and right "shoulder") peaks.

Freiberg et. al., (EP 1089452) disclose: a method of determining cross-correlation peaks by using quadratic approximation/curve fitting.

Saitou (U.S. 2003/0123408) discloses: a system determining a peak timing position using interpolation of received (power or amplitude) samples.

Yang (U.S. 6,407,699) discloses: a system that determines a correlation peak in a multipath environment by interpolating two adjacent peaks of the triangular correlation function.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is 571 272 5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SV
1/15/2007

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER